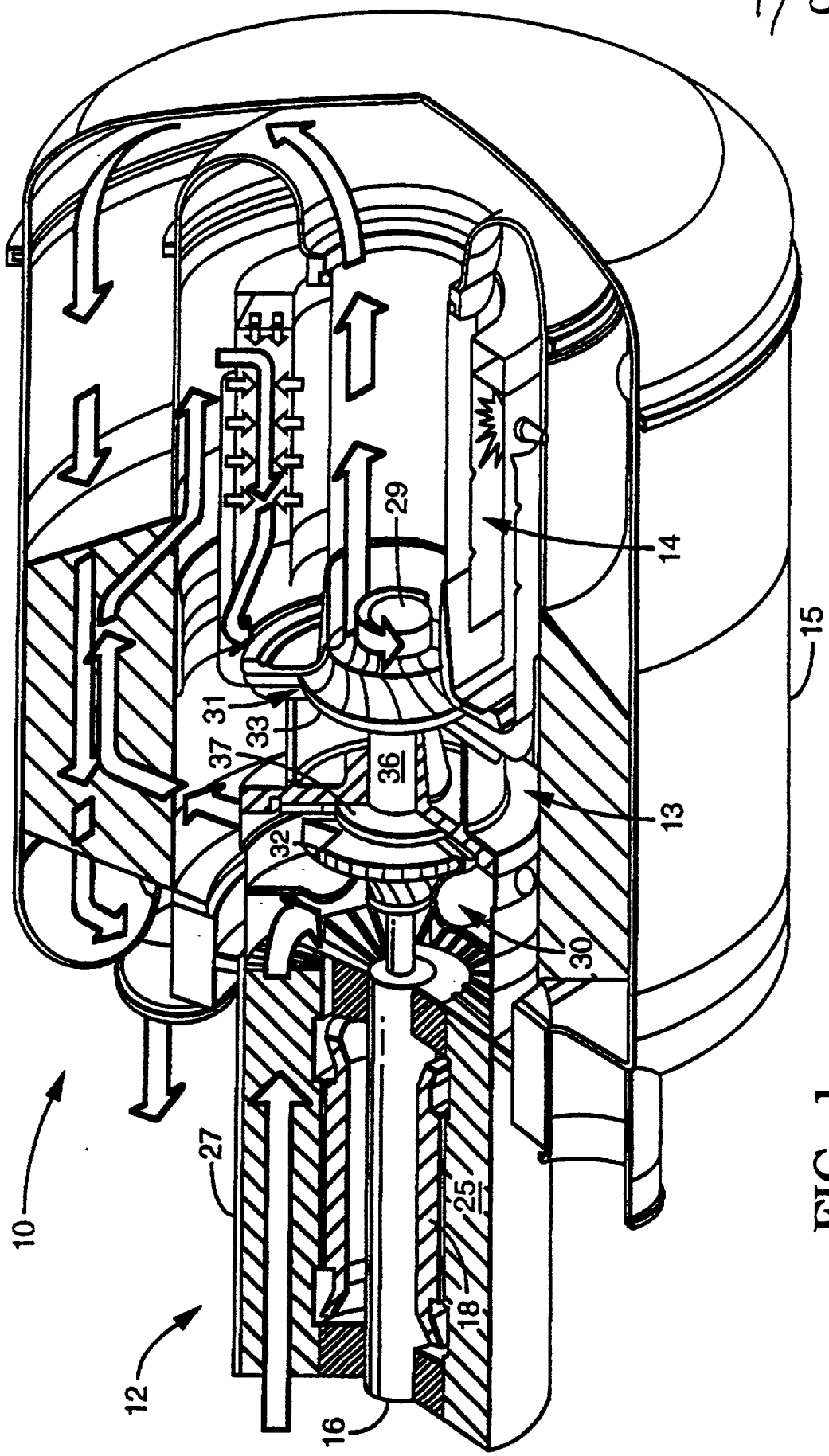

FIG. 1

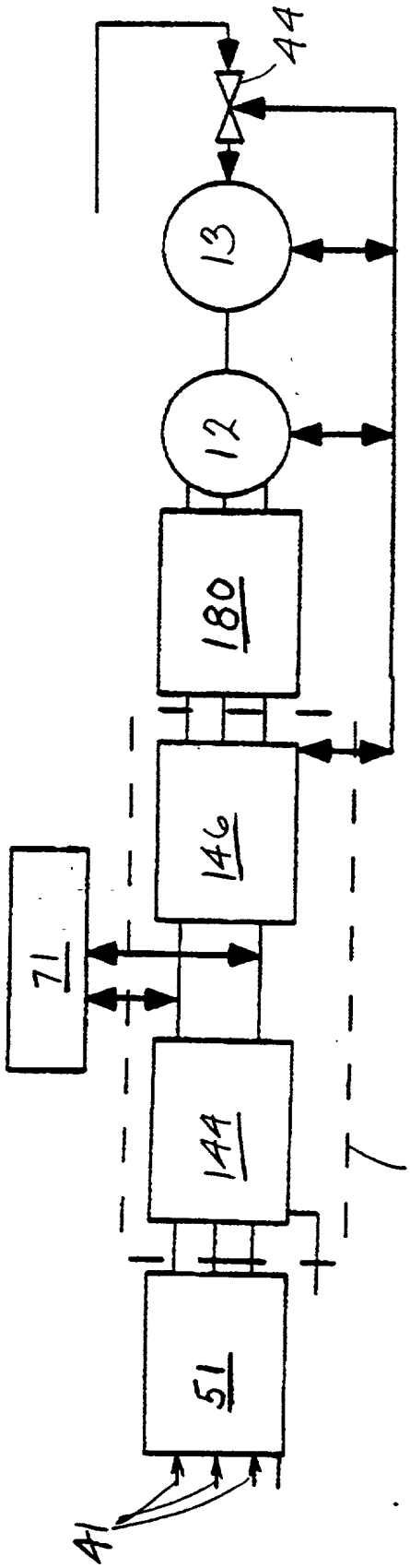

FIG. 2

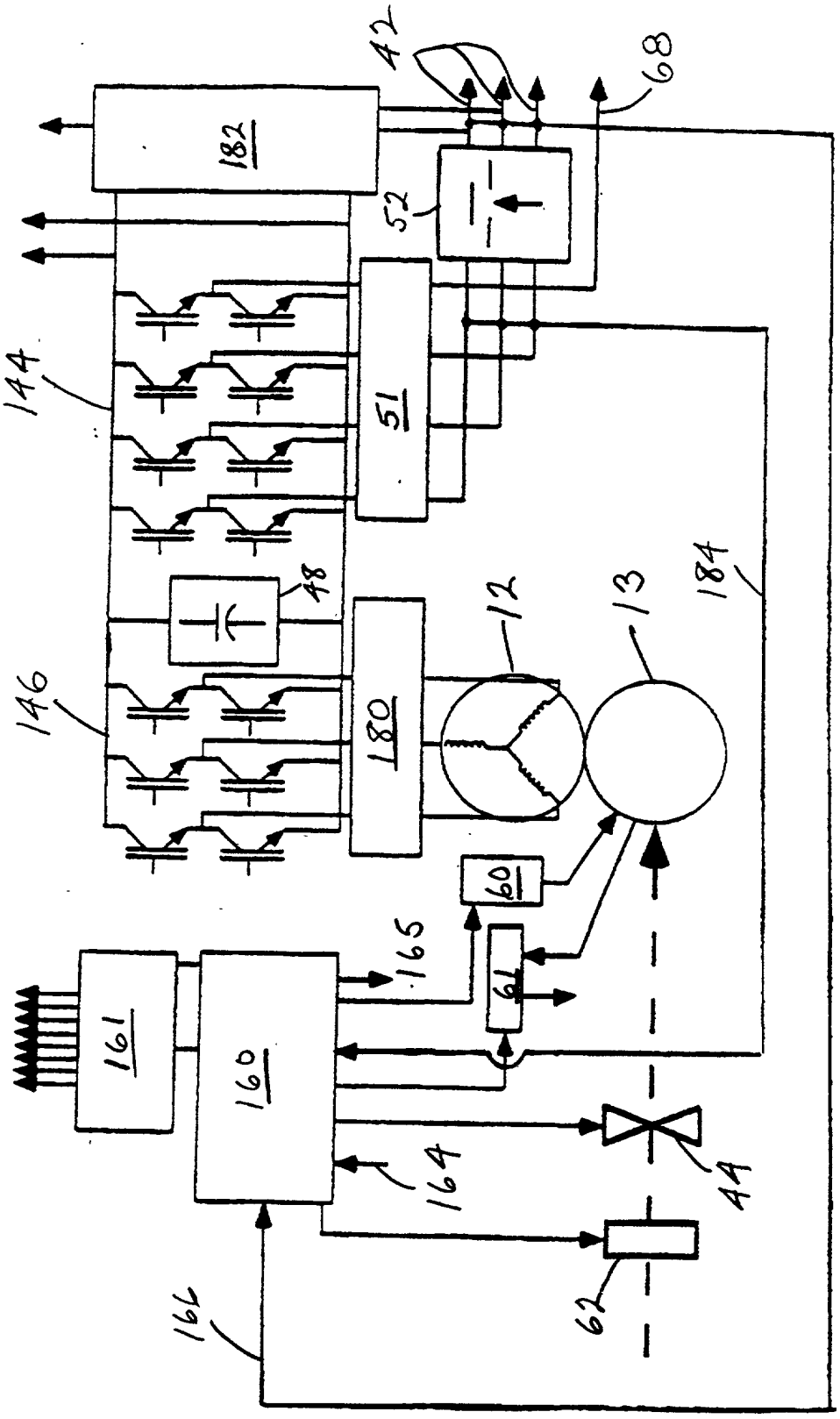
42
68
182
52
144
51
48
146
180
12
13
184
60
165
61
161
160
164
44
62
166

FIG. 3

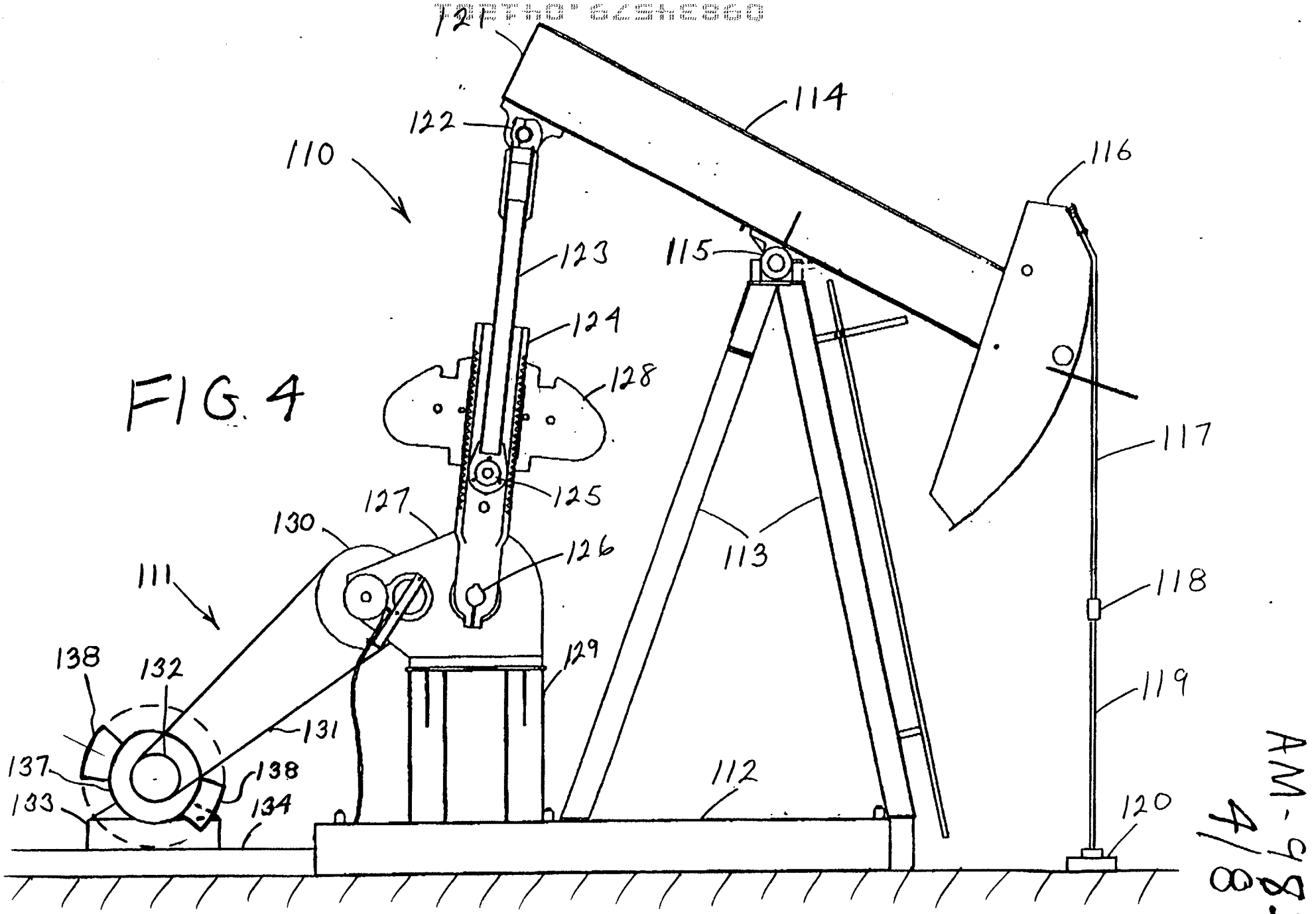

FIG. 4

AM-9810
4/8

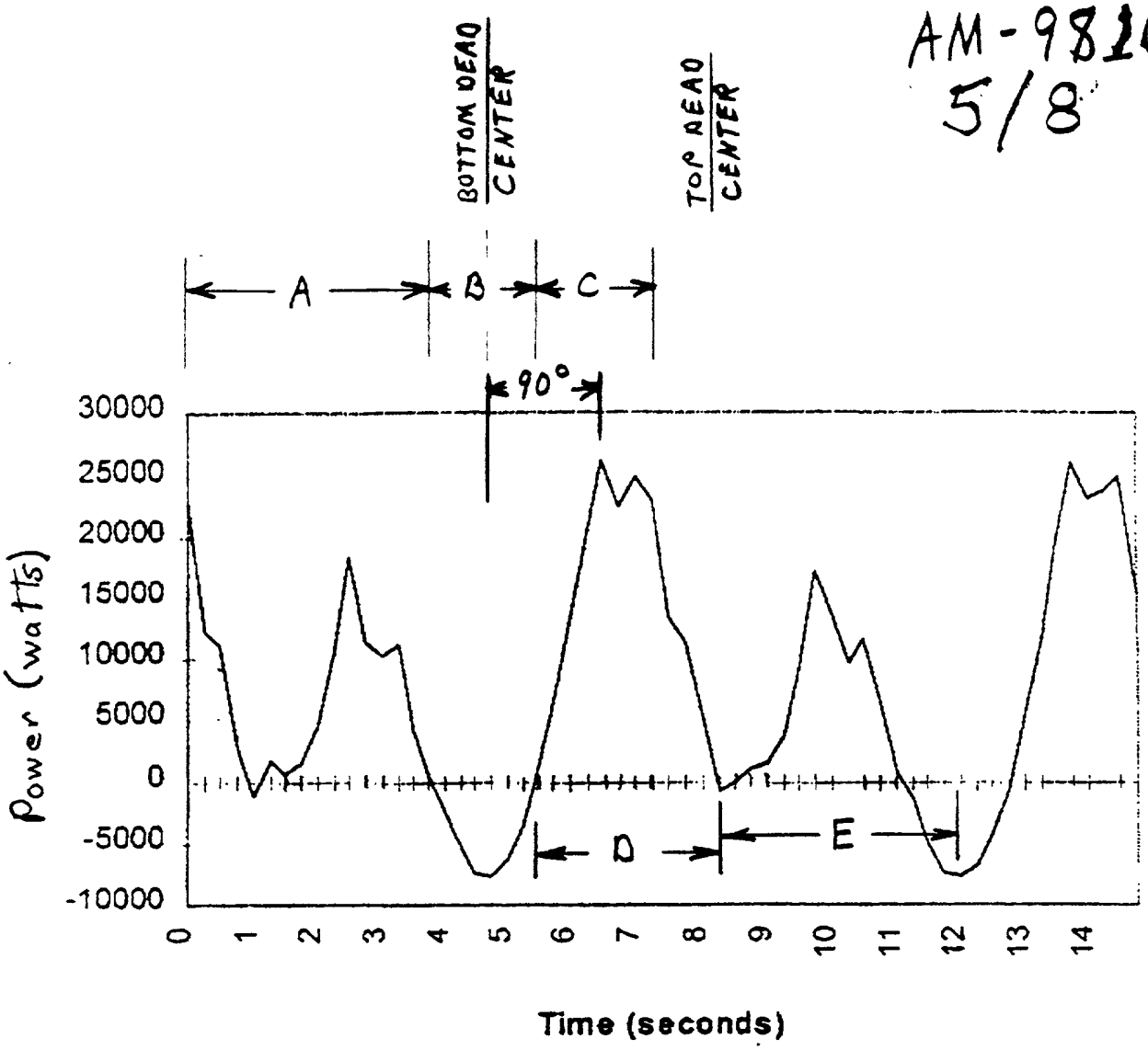
BOTTOM DEAD CENTER
TOP DEAD CENTER
A
B
C
90°
30000
25000
20000
15000
10000
5000
0
-5000
-10000
Power (watts)
D
E
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Time (seconds)

Fig. 5

FOREIGN PUBLISHED

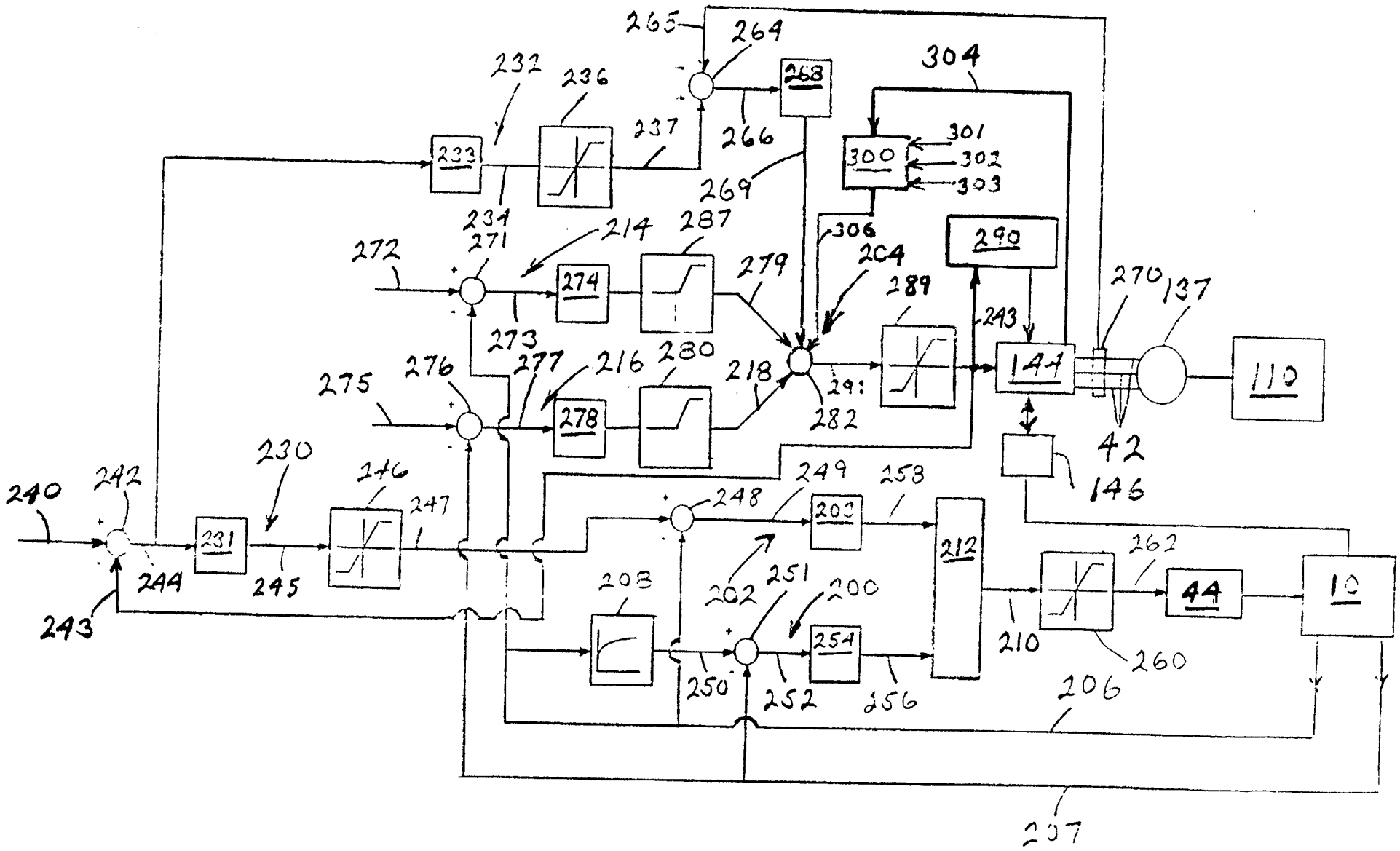

FIG. 6

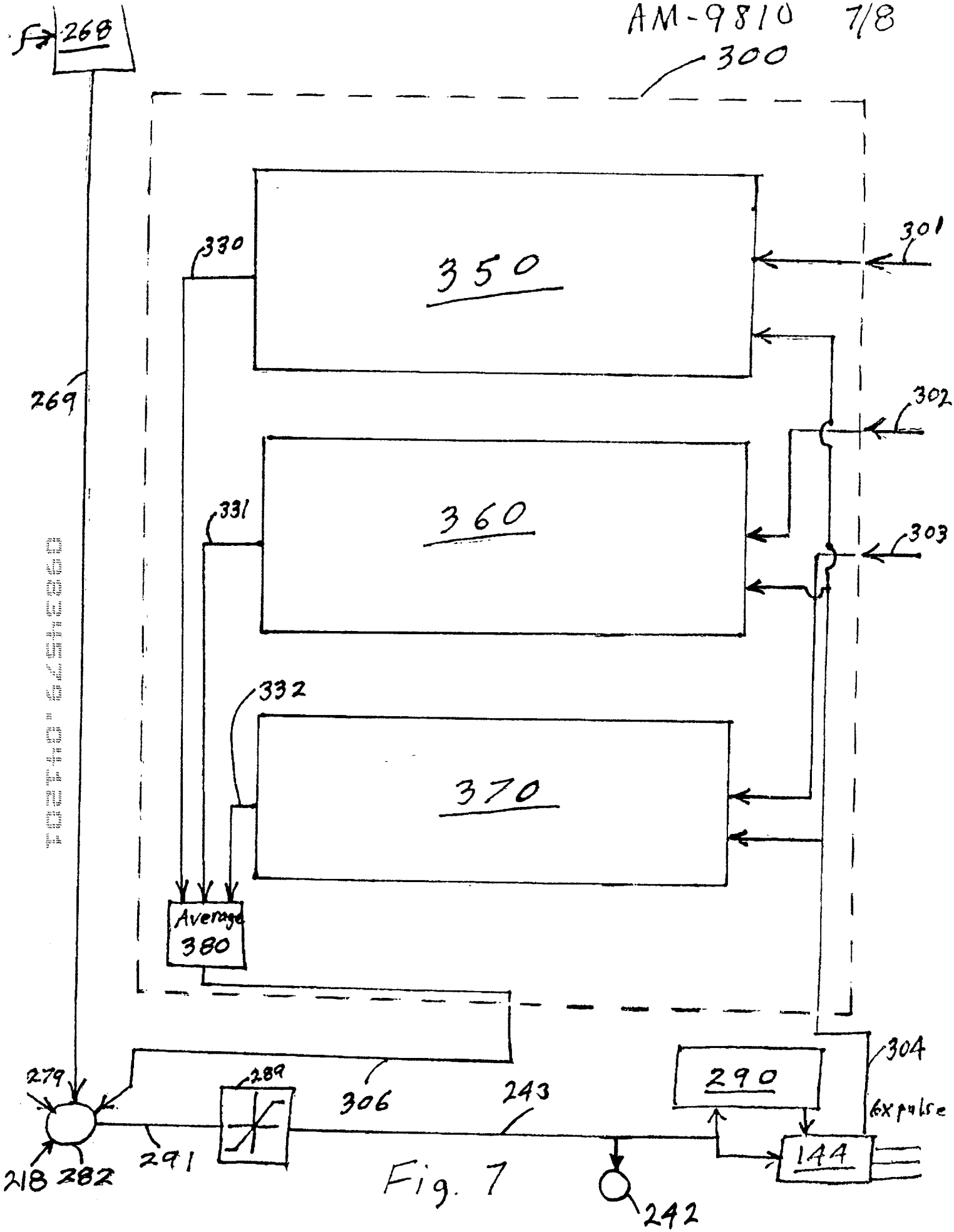
268
300
350
330
301
269
302
360
331
303
332
370
Average
380
279
289
306
243
290
304
Expulse
144
218
282
291
242

Fig. 7

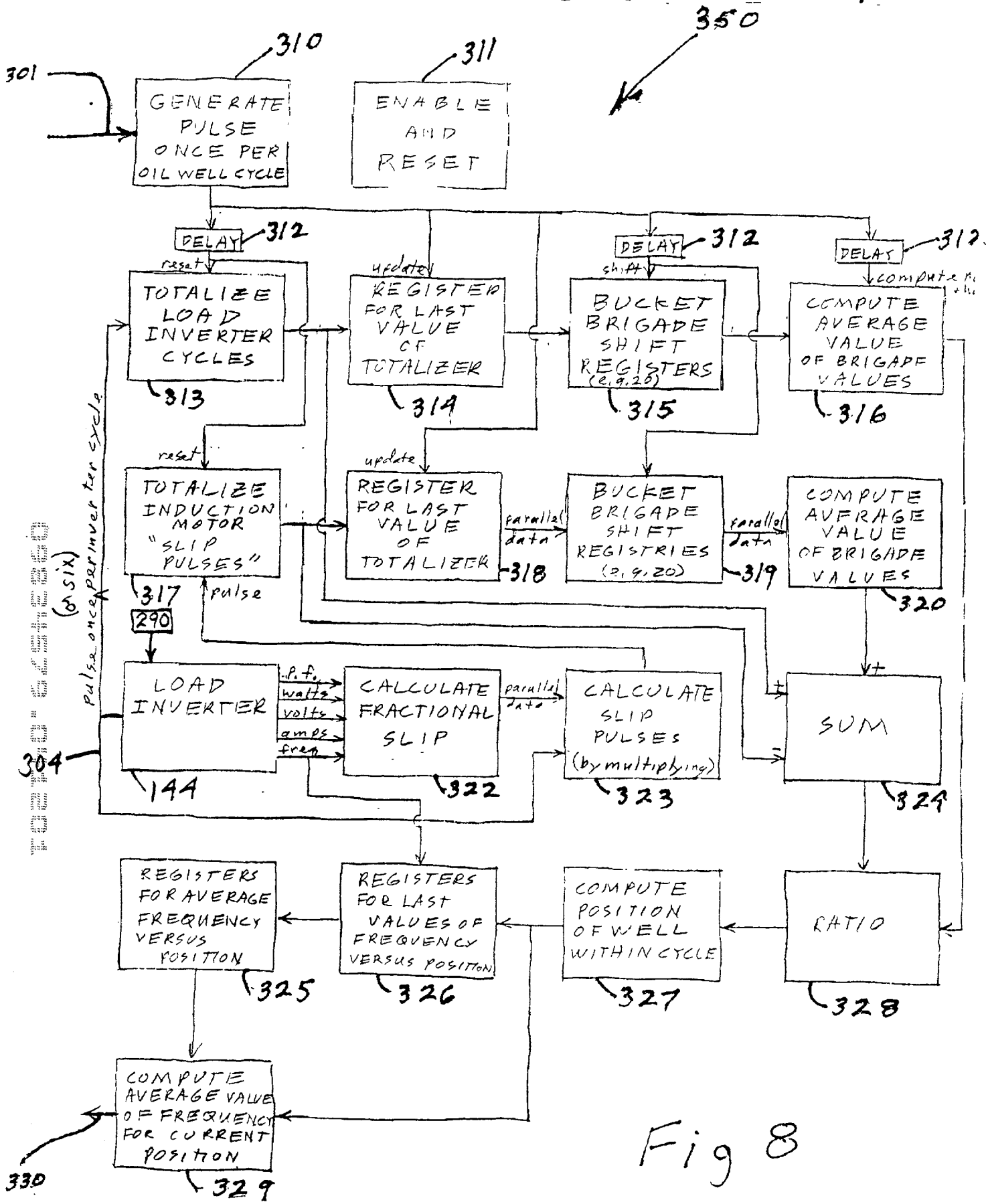
350
310
311
301
GENERATE PULSE ONCE PER OIL WELL CYCLE
ENABLE AND RESET
DELAY 312
DELAY 312
DELAY 312
reset
update
shift
compute
TOTALIZE LOAD INVERTER CYCLES 313
REGISTER FOR LAST VALUE OF TOTALIZER 314
BUCKET BRIGADE SHIFT REGISTERS (e.g. 20) 315
COMPUTE AVERAGE VALUE OF BRIGADE VALUES 316
reset
update
TOTALIZE INDUCTION MOTOR "SLIP PULSES" 317
REGISTER FOR LAST VALUE OF TOTALIZER 318
parallel data
BUCKET BRIGADE SHIFT REGISTRIES (e.g. 20) 319
parallel data
COMPUTE AVERAGE VALUE OF BRIGADE VALUES 320
pulse once per inverter cycle (or six)
pulse
290
LOAD INVERTER 144
304
P.F.
watts
volts
amps
freq
CALCULATE FRACTIONAL SLIP 322
parallel data
CALCULATE SLIP PULSES (by multiplying) 323
SUM 324
REGISTERS FOR AVERAGE FREQUENCY VERSUS POSITION 325
REGISTERS FOR LAST VALUES OF FREQUENCY VERSUS POSITION 326
COMPUTE POSITION OF WELL WITHIN CYCLE 327
RATIO 328
COMPUTE AVERAGE VALUE OF FREQUENCY FOR CURRENT POSITION 329
330

Fig 8